Bald Eagle (*Haliaeetus leucocephalus*) Nesting in Iowa
2013

Introduction

Iowa has experienced a dramatic increase in the number of nesting Bald Eagles over the past 20 years. Nationally, the Bald Eagle has recovered enough from the dangerously low numbers of the 1960's and 1970's that the U.S. Fish and Wildlife Service removed it from the Threatened and Endangered species list (T&E list) in 2007. Iowa followed suit by upgrading the eagle from a status of Threatened to a status of Special Concern on the state T&E list in 2009. Despite the Bald Eagle population's apparent good health, challenges to their conservation still exist. Strategic monitoring of eagle activity in the state, particularly nesting, remains a priority.

Since eagles returned to nest in Iowa in the late 1970's, the DNR has engaged in opportunistic data collection on eagle nesting territories. In 2010, the Iowa Department of Natural Resources (DNR) started collecting data on bald eagle nesting territories in two different ways; one opportunistic and one systematic. Both of these data collection methods rely on citizen volunteers. The "opportunistic" includes casual monitoring of some eagle nests by DNR personnel as well as reports of nest locations and activity from Iowa citizens. These data are not systematically collected so the data available for each territory varies. Additionally, territories reported on may not be representative (i.e. people may be more likely to report on an active nest than an inactive nest).

In 2010, the DNR began a second and more formal program for monitoring eagle nests. This program involves randomly selecting a targeted number of nesting territories and establishing them as "sentinel" sites. Each of these sentinel sites is assigned a volunteer as its official monitor. The monitor makes 3 visits to the nest site and systematically collects data on the activity and productivity of the territory. The number of sentinel territories is 130 and represents at least 50% of our known active territories in the state (excluding territories on the Upper Mississippi Wildlife Refuge).

A Note on Terminology

A discussion of eagle nesting presents some complexities because of the bird's nesting ecology. While eagles exhibit strong nest site fidelity and return year after year to the same spot, there are some very common variants of this behavior that can complicate what we mean by an "active eagle nest".

In this document, the primary references will be to bald eagle territories. Eagles can build and use more than one nest per territory across time and space. The definition used by the DNR for a Bald Eagle territory is as follows; *"A habitat area up to 1 mile in radius (though sometimes smaller in good habitat) that is defended by a pair of eagles and used for breeding. Meets all breeding habitat needs including appropriate trees (or very occasionally other structures) to build nests and a nearby food source. A territory may hold more than 1 nest but may not house more than 1 pair of eagles within the same breeding season. The pair of eagles need not be the same pair across years."* When a new nest is reported, every effort is made to determine whether it belongs to an existing or represents a new territory.

Another term that appears straightforward at first, but can be problematic, is the term "active". There are two definitions of "active" used in our dataset. One denotes whether a nesting territory is active or inactive. This is an overall designation and may not be directly related to what occurred in the territory during the current nesting season. The definition for this is as follows; *"Any Bald Eagle*

territory that has had some eagle activity within the previous two years of the current nesting season. Activity does not imply breeding success." Eagle territories are commonly inactive one season but active again the next, which is why a territory must be unused for at least three seasons before being designated inactive. The second use of "activity" in the dataset relates to the yearly status of the nests within a territory.

Bald Eagle Nesting Statistics

All Survey Data (including opportunistically collected data)

Since 1977, approximately 683 bald eagle territories have been reported to the Iowa DNR. There are reports of nests from 96 of Iowa's 99 counties, with Crawford, Ida, Madison and Shelby counties having their first confirmed report in 2013 (Fig. 1). Allamakee County, with 127, has the highest number of nests reported, followed by Clayton County with 64 (Fig. 1). Following the 2013 nesting season, 363 territories have an overall designation of active (Fig. 2), 136 are designated inactive, and 162 have an unknown status (this usually means they have not been reported on >3 years but the nest was active at last report). Within the active territories, 126 of them are located on the Iowa portion of the Upper Mississippi Wildlife Refuge and 237 of them are spread throughout the rest of the state (called inland territories).

In 2013, reports were received for 347 territories with 59 being reported for the first time. Roughly 69% (241) of the territories were reported active in 2013, and 18% (63) were reported inactive. The remaining 43 territories were reported with unknown activity (Table 1).

Forty-five percent (109) of the territories reported as active in 2013 included data on the outcome of the nesting season. Twenty-three (21%) of the 109 nests ended up failing, and 86 (79%) were successful in producing young. For the 109 territories for which we have a good count of fledglings, a total of 148 young were produced, which averages to 1.36 young produced per nest. If we extrapolate, assuming 79% of all nests reported as active would be successful (n=190); this would produce an estimate of 258 young fledged from Iowa nests in 2013.

It should be noted that looking at the entire dataset has problems because it is highly influenced by reporter behavior; i.e. the number of people reporting their observations varies as does the nests that are reported on. The opportunistically reported data is important because it is the primary source of new nest reports and does provide a valuable yearly snapshot. However, the full dataset, including the opportunistic reports, may not be representative of the nesting population as a whole and is misleading when examining trends across years. The sentinel territory monitoring put into place in 2010 compensates for some of these full dataset weaknesses.

S*entinel Territory Monitoring Data*

2013

The sample size of sentinel territories for 2013 was 130, with 6 territories being retired as confirmed inactive (reported as inactive for 3 years in a row). We were able to secure monitors for 98 of these territories (Fig. 3, Table 2) and data was received on 80 (82%) which represents 34% of the known active inland territories (objective is to have data on 25%). Within the 80 territories, 65 were active (82%), 12 were inactive (15%), and 3 could not be found or had unknown activity (Table 2, Fig. 4). The outcome of the 65 active nests broke down as follows: 40 successful, 6 failed and 19 unknown (Table 2, Fig. 5).

Seventy-two young were produced by the active nests: 6 nests fledged no young, 10 nests fledged 1 young, 28 nests fledged 2 young and 2 nests fledged 3 young. The estimated number of young produced per nest was 1.57 (Table 2, Fig. 6).

For 38 territories, monitors were able to collect data on the number of chicks and the number of fledglings. From these data it appears that eaglet survival to fledging was high; 95% of the chicks observed in these nests reached fledging.

Future Plans and Other Bald Eagle Projects

2014 will be the fifth year of data collection for the sentinel nest program and as such it will be appropriate to start looking at trends in more detail than what is presented here. The data that will be most useful for these analyses will be for territories that have consistently been monitored for at least 4 years. Hopefully, volunteers will continue to be motivated to get out and watch their eagles.

We will be giving a presentation on this program and the citizen science component of it at the 74th annual Midwest Fish and Wildlife Conference in Kansas City in late January. Part of the objective of the talk will be to illustrate to other states the benefit of using volunteer monitors to track Bald Eagle nesting. It will also be useful in reviewing the program and its strengths and weaknesses.

We will be holding two training workshops this year in March. One will be held in Algona in Kossuth County on March 8th and the other in Elgin in Fayette County on March 15. Details on the schedule and how to register can be found on the website: www.iowadnr.gov/volunteerwildlifemonitoring/.

Conclusions

A record number of total territories were reported on this year, with roughly 69% being active. This level of activity is slightly lower than the 16 year average (since 1998) which sits at 75%. For the sentinel territories, we have only four years of data to examine, and 2013's percentage of territories active is slightly higher than the previous three years and in line with the 4 year average (79%, Fig. 4).

The success rate of active sentinel nests was lower than the two previous years, though the failure rate of nests was lower. There were a larger percentage of nests for which the outcome was unknown and there is no simple explanation of why that occurred. Also, there was a pretty large disparity between the average number of young produced per nest between the sentinel nest data (1.57) and the full dataset (1.36). Production on the Upper Mississippi Refuge was relatively low this year (1.26) and nests on the refuge accounted for a little over a quarter of the total dataset. The weather in 2013 was also unstable with a very wet spring followed by drought, which likely had an impact on many wildlife species. In either case production remained above 1 fledgling per nest which is a crucial threshold. If the average young per nest ever fell below 1 for three years in a row, conservation action would be considered. Other thresholds include the trend in Active vs. Inactive and Successful vs. Failed nests moving closer together for three years consecutively.

We exceeded our goal of monitoring 25% of the active inland territories which is an important milestone. We do want to continue to monitor more territories, however, because we only received outcome data on 46 territories, which represent only about 19% of the inland territories. We also need to continue to ensure that we receive consistent yearly data on 25% of nests, which we have also not achieved. However, since the average number of young per nest has stayed above one and the percentage of successful nests was still solidly high, the overall picture is positive. A record number of nests were reported again this year and we had a very high volunteer participation rate. We can say

with confidence that Iowa has at least 241 active territories and that the true number of active territories is likely higher.

Acknowledgements

A huge debt of gratitude goes out to our Bald Eagle Nests Monitors, who continue to provide many insights, along with their data, about Bald Eagles in Iowa. Thank you!

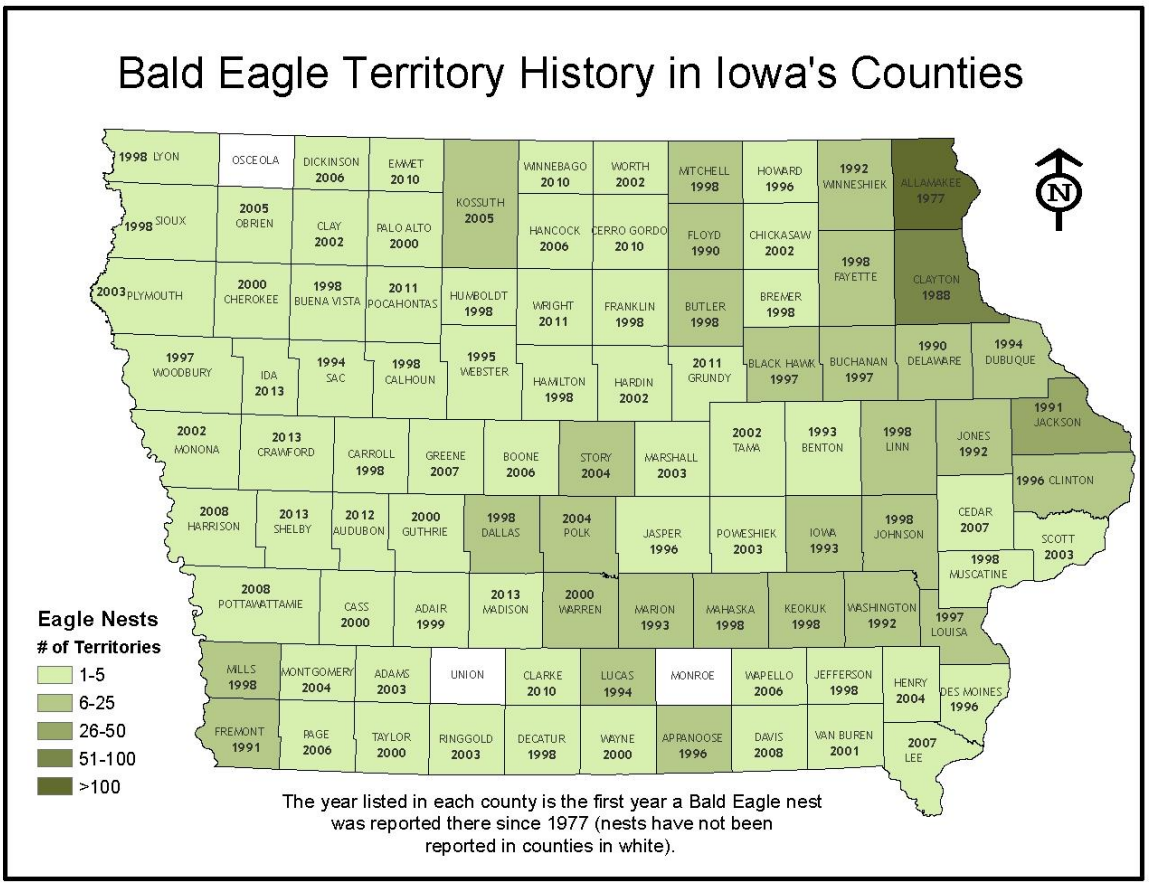

Figure 1. Bald Eagle Territory History in Iowa by County

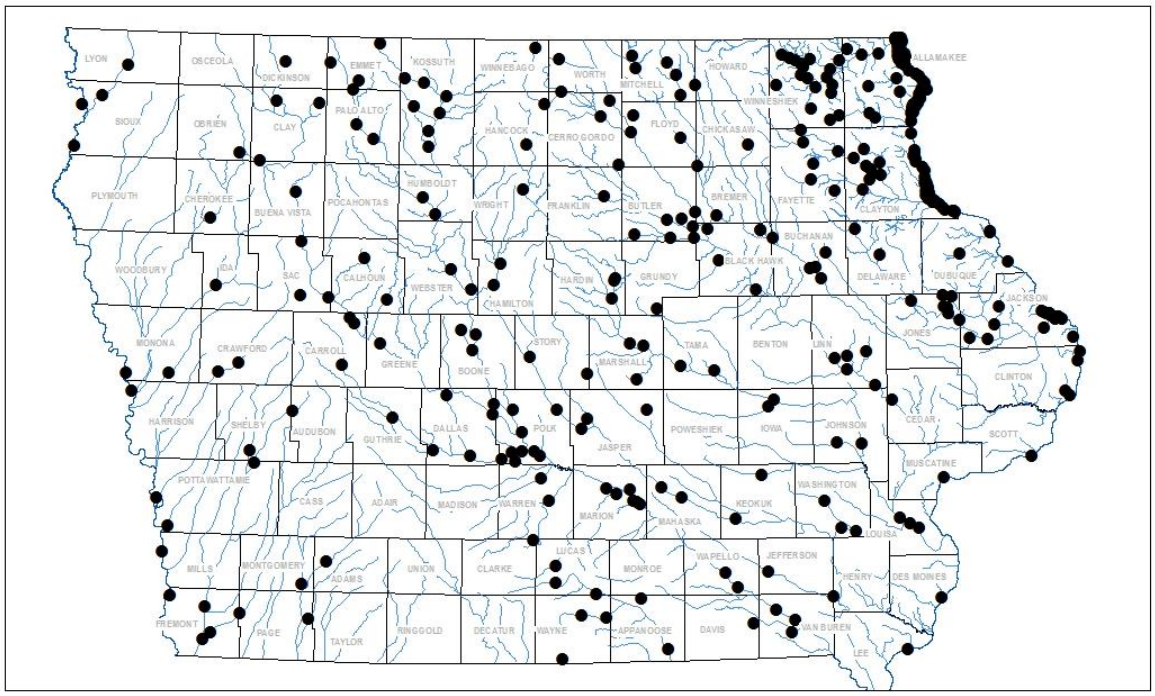

Figure 2. Iowa Bald EagleTerritories, 2013

Legend

- Active Bald Eagle Nests
- Major Rivers

Summary:

Total Active Bald Eagle Territories: 363
Reported as Active in 2013: 241

N

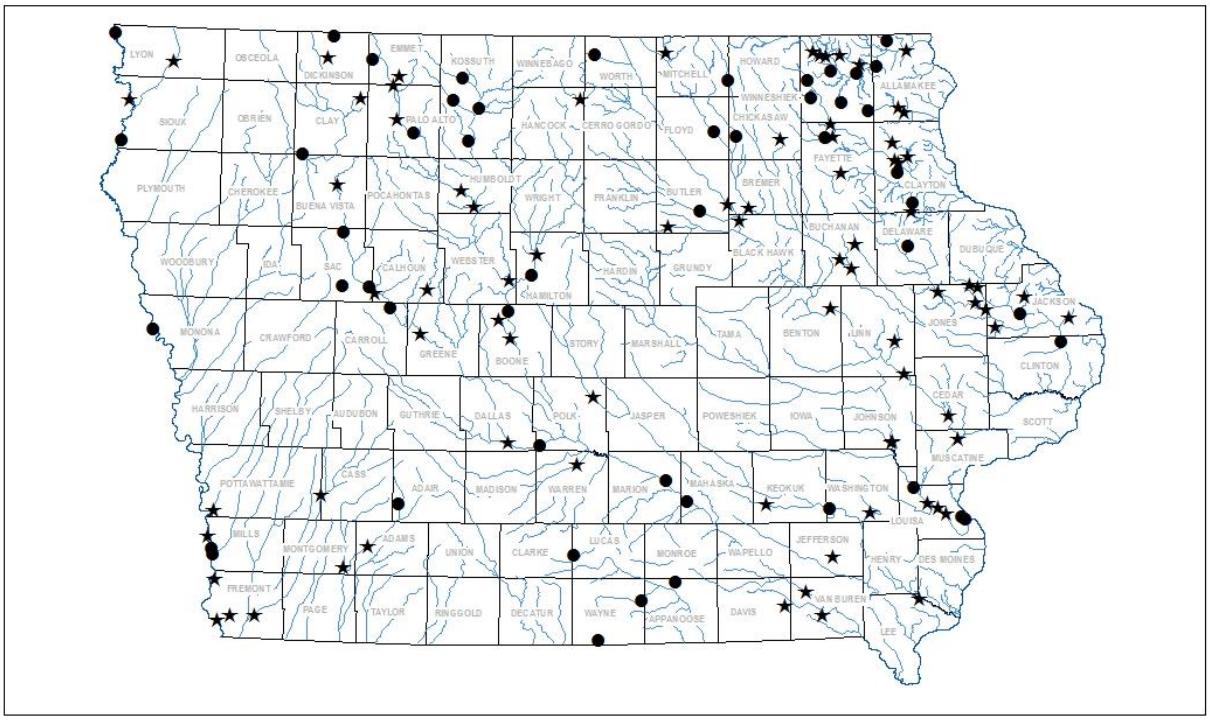

Figure 3. Iowa Sentinel Bald Eagle Territories, 2013

Legend

- ★ Sentinel Territories With Data
- ● Sentinel Territories Without Data
- Major Rivers

Table 1. Yearly Iowa Eagle Nest Opportunistic Report Summary

Year	Total # of Territories Reported	# of New Territories Reported	# of Nests Reported Active	# of Nests Reported Inactive	# of Territories with production known	Total # of young produced	Average young produced per Territory
1998	94	78	76	13	62	73	1.18
1999	88	31	66	19	47	66	1.40
2000	76	22	56	10	36	48	1.33
2001	67	9	48	14	27	34	1.26
2002	92	17	70	12	29	47	1.62
2003	106	27	85	8	41	61	1.49
2004	114	22	85	19	29	39	1.34
2005	121	14	88	24	42	70	1.67
2006	139	12	112	23	43	60	1.40
2007	170	17	135	29	59	92	1.56
2008	198	85	136	57	48	70	1.46
2009	283	63	210	66	63	97	1.54
2010	265	47	205	40	94	138	1.47
2011	299	50	220	63	76	116	1.53
2012	318	57	231	66	98	151	1.54
2013	347	59	241	63	109	148	1.36
TOTAL						**1310**	
AVG							**1.45**

Table 2.Summary of Monitoring Results for Sentinel Bald Eagle Nests

	2010	2011	2012	2013
Total Territories Chosen	54	136	136	130
Assigned Territories	48	81	95	93
# of Territories With Data Collected	42	69	77	80
Active Territories	33	52	61	65
Successful	*18 (55%)*	*37(71%)*	*45(74%)*	*40(62%)*
Failed	*6 (18%)*	*6 (12%)*	*3 (5%)*	*6 (9%)*
Outcome Unknown	*9 (27%)*	*11(21%)*	*13(21%)*	*19(29%)*
Number of Young	*35*	*50*	*71*	*72*
Avg. # of Young/Nest	*1.46*	*1.16*	*1.48*	*1.57*
Inactive Territories	4	14	14	12
Unknown Territories	5	3	3	3

Fig. 4 Percentage of Iowa Sentinel Territories Active in 2013 vs. Inactive

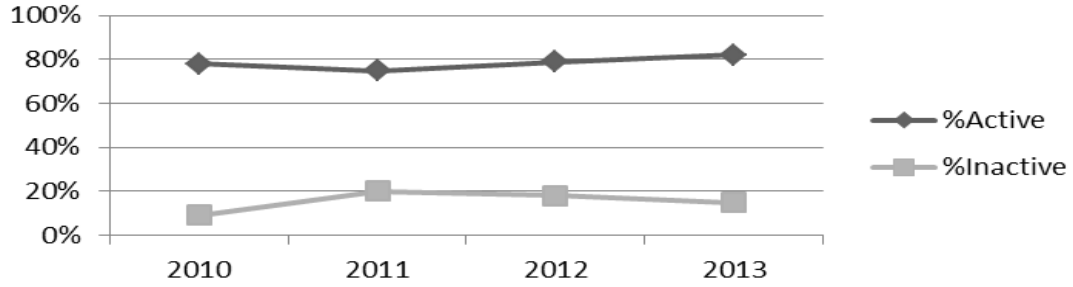

Fig. 5 Percentage of Active Sentinel Territories that were Succesful vs. Failed in 2013

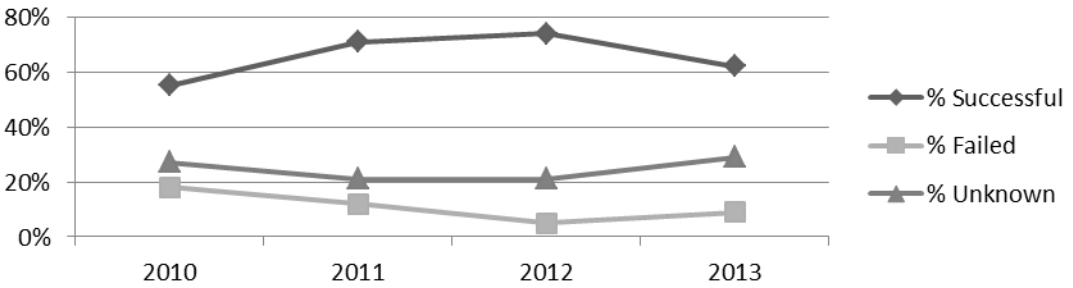

Fig. 6 Average Young/Nest for Iowa Sentinel Territories